REMARKS

Claims 1-26 were pending at the time of examination. No claims have been amended, added or canceled. The applicant respectfully requests reconsideration based on the foregoing amendments and these remarks.

Claim Rejections – 35 U.S.C. § 103

Claims 1-26 were rejected under 35 U.S.C § 103(a) as being unpatentable over U.S. Patent Publication No. 2002/0052692 to Fahy (hereinafter "Fahy") in view of U.S. Patent No. 6,973,459 to Yarmus et al. (hereinafter "Yarmus"). The applicant respectfully traverses these rejections.

In the Office Action, the Examiner cited U.S. Patent No. 6,973,4**95**, but this patent is to Milne et al. and pertains to a different technology area, so the Applicant assumes that the Examiner made a typographical error, and intended to cite U.S. Patent No. 6,973,4**59** to Yarmus et al. Absent other indications from the Examiner, the Applicant also continues to believe that the anticipation rejection of claims 1-10 and 15-26 is still added in error under the heading of the obviousness rejection, and thus it will not be addressed herein.

Claim 1 recites:

"A processor-implemented method of clustering a set of records, each of the records having attribute values for a set of attributes, the method comprising:
for each attribute of the set of attributes, determining a characteristic value for said each attribute, based on attribute values of said each attribute;
wherein determining the characteristic value comprises calculating the attribute values of said attribute across the records;
for each attribute value, determining a deviation from the characteristic value of said each attribute;
for each record, sorting the set of attributes based on deviations of the attribute values, to provide a key; and
clustering the set of records based on the key into a clustering result that includes a plurality of clusters;
wherein the key comprises an ordered list of the set of attributes and the deviations; and
refining the clustering result by selectively changing a length of the key to change the number of the clusters."

The Examiner alleges that steps 210-214 in FIG. 3 and paragraphs [0009]-[0010] of Fahy disclose "for each attribute of the set of attributes, determining a characteristic value for said each attribute, based on attribute values of said each attribute" and "wherein determining the characteristic value comprises calculating the attribute values of said attribute across the

records." The Applicant respectfully disagrees. FIG. 3 of Fahy describes receiving (step 212) and preconditioning (step 214) a test matrix to assign test subjects to non-hierarchical clusters. In particular, Fahy uses "K-means clustering" (Fahy, paragraph [0046]), which uses "Euclidean distances between the various gene activity values of the test subject rows of a text matrix to determine distances between the test sample rows" (Fahy, paragraph [0047]). No mention is made in Fahy about determining a characteristic value by calculating attribute values of an attribute across records, as required by claim 1. Even when Fahy discusses choosing cluster seeds in paragraph [0049], he provides a different set of methods, such as "sequential threshold, parallel threshold, and optimization," which are all different from determining characteristic values, as recited in claim 1.

Claim 1 further requires "for each attribute value, determining a deviation from the characteristic value of said each attribute." The Examiner alleges that this is shown by the K-mean Euclidean distance technique in Fahy. The Applicant respectfully disagrees. Again, as can be seen in paragraph [0047] of Fahy, the Euclidean distance is determined *between the various gene activity values of the test subject rows* of a text matrix *to determine distances between the test sample rows.*" There is no determination of a deviation (of a Euclidean distance or otherwise) in relation to a characteristic value in Fahy.

Claim 1 further requires "for each record, sorting the set of attributes based on deviations of the attribute values, to provide a key." Respectfully, this is not shown in Fahy for the following reasons. First, no deviations of the kind described in claim 1 (i.e., from a characteristic value) are shown in Fahy, as discussed above. Second, the sorting in Fahy is done based on "hierarchical assignment values" in step 224 (Fahy, paragraph [0065]), that is the sorting is done after hierarchical clusters have been formed and is based on information associated with the clusters. In contrast, claim 1 requires that the sorting is done to provide a key, which is used in the subsequent step to cluster the records, as will be discussed below. That is, there are no clusters in the applicant's invention at the time of sorting.

The Examiner is not clear about what part of Fahy would be equivalent to the key recited in claim 1. To the best of the Applicant's understanding, this key would correspond to the color that is assigned to measurement values of the test matrix in Fahy, as described in FIG. 4 and paragraphs [0065]-[0066]. This gets even more confusing when the Examiner tries to apply the key to the next step of claim 1, which recites "clustering the set of records based on the key into a clustering result that includes a plurality of clusters" and "wherein the key comprises an ordered list of the set of attributes and the deviations." As was discussed above, the clustering in Fahy is already done before the "key" is provided, and the colors in Fahy are respectfully not the

same as "an ordered list of the set of attributes and the deviations", which is required by claim 1, especially since no such deviations are determined in Fahy. The Applicant would greatly appreciate if the Examiner could clarify his reasoning on this issue.

The Examiner acknowledges that Fahy does not teach the last limitation of claim 1 of "refining the clustering result by selectively changing a length of the key to change the number of the clusters" and relies on Yarmus for this showing. However, the cited sections of Yarmus do not describe any refining by "selectively changing a length of the key to change the number of the clusters," as required by claim 1. On the contrary, col. 7, lines 49-60 of Yarmus generally describes the concept of "binning," and col. 14, line 35 – col. 16, line 7 describes a Minimum Description Length (MDL) model that is used to test whether a new feature should augment the current model or replace the current model altogether (col. 7, lines 54-56) and discusses whether additional components increase or decrease predictive accuracy of the conglomerate Bayes model (col. 7, lines 38-41). None of these sections discuss selectively changing the length of a key to change the number of the clusters, as required by claim 1.

In order to establish a *prima facie* case of obviousness, the Examiner must show a motivation to combine Fahy and Yarmus. Nothing in Fahy suggests a desire to combine his hierarchical cluster analysis of biological data including highly dense gene array data with the Adaptive Bayes network data mining model presented in Yarmus.

Furthermore, the Examiner needs to show a reasonable expectation of success, which the Examiner has failed to do since he has not shown how Yarmus' "stepwise MDL feature selection" that is used to prune features from the array of trees in Yarmus would be combined with the "K-means clustering" of Fahy. Making a general statement that "Fahy and Yarmus are both of the same endeavor to changing (or reducing) the clustering size of a set of records based on the K-mean clustering (or binning) processing" (Office Action, page 4) may be accurate, but only having this statement in combination with a general reference to large portions of Fahy and Yarmus ("Fahy: Fig. 4 and associated texts; Yarmus: col. 7 lines 49-60, col 14, line 35 - col. 16, line 7") is not a showing of a reasonable expectation of success.

Finally, the combination of the references must teach or suggest all the claim limitations. Even if it were possible to combine Fahy and Yarmus, the combination still would not teach the limitation of "refining the clustering result by selectively changing a length of the key to change the number of the clusters" as neither of the references, alone or in combination, discloses the keys or refinements recited in claim 1. For at least these reasons, the rejection of claim 1 is unsupported by the art and should be withdrawn.

For reasons substantially similar to those set forth above, the Applicant respectfully contends that the rejection of claims 15 and 21 is unsupported by the cited art and should be withdrawn.

Claims 2-14, 16-20, and 22-26 depend from claims 1, 15 and 21, respectively, and are thus not anticipated or rendered obvious for at least the reasons discussed above with respect to claims 1, 15, and 21.

Conclusion

The Applicant believes that all pending claims are allowable and respectfully requests a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

Respectfully submitted,
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